

	Design Team PS&E Development Process			Final PS&E Review Process	
Deliverables	Permitting Submittal Review	Intermediate PS&E Submittal Review(s) (60%)	PS&E Presubmittal Review (90%)	Final PS&E Submittal Review(s) (100%)	Ad Copy
<b>SIGNALS</b>					
Electrical Calculations	<ul style="list-style-type: none"><li>Identify Design Criteria,</li><li>Identify deficiencies of the existing system and proposed mitigation and impacts to existing system</li><li>Submit Calculations to Support signal type</li></ul>	<ul style="list-style-type: none"><li>Calculations to support transformer sizing and transformer overcurrent protection</li><li>Electrical load and line loss calculations to support breaker, wire and lighting contractor sizing where applicable for each electrical circuit.</li><li>Service load calculations</li><li>Load balancing required for 3-phase service.</li><li>Submit Phasing analysis to support left turn phasing</li><li>Submit calculations for loop placement</li></ul>	<ul style="list-style-type: none"><li>Backup data and calculations submitted for review.</li></ul>		
Design Documentation	<ul style="list-style-type: none"><li>Speed study data indicating 90<sup>th</sup>, 85<sup>th</sup>, and 10<sup>th</sup> percentile speeds for all approaches.</li><li>Warrant Analysis</li><li>Peak hour turning movement counts (am, midday, pm)</li><li>Phasing analysis to support protected or protected-permitted left turn phasing.</li></ul>	<ul style="list-style-type: none"><li>Submit design data for special design (for span wire installations, strain pole class and foundation selection calculations are required)</li><li>Submit windload calculations on signal mast arm to determine foundation depth</li></ul>	<ul style="list-style-type: none"><li>Justify deviation from standard practices.</li><li>Complete justification for use of non-standard equipment.</li><li>Attach catalog cuts and data.</li><li>Submit documentation for design decision (display type, mast arm, metal or timber strain pole, controller type)</li></ul>		
Electrical Service		<ul style="list-style-type: none"><li>Utility Agreement and Utility Relocation Requests Submitted</li><li>Electrical Service location identified, service agreement request processed.</li></ul>	<ul style="list-style-type: none"><li>Service Agreement completed.</li><li>Utility coordination completed</li></ul>		
Coordination & Constructability		<ul style="list-style-type: none"><li>Coordinate with State Bridge Office for attachment to structures.</li><li>Overhead &amp; underground utility issues and conflicts addressed</li><li>Identify order of work issues</li></ul>	<ul style="list-style-type: none"><li>Address conflicts between signal and existing utilities and new construction.</li><li>Address order of work issues.</li><li>Applicable Maintenance and Operations Agreements processed.</li><li>Coordinate Signal plans with other work on the project</li><li>Check that responses from 30% and 60% reviews are addressed</li></ul>		
Temporary Signal Plans		<ul style="list-style-type: none"><li>Identify temporary signal needs and complete preliminary layout.</li></ul>	<ul style="list-style-type: none"><li>Complete temporary signal plans.</li></ul>		
Signal Plans	<ul style="list-style-type: none"><li>Base Signal Plans showing channelization information</li><li>Verify as-builts with site investigation</li></ul>	<ul style="list-style-type: none"><li>Pole, controller, service, conduit and junction box locations shown on plans.</li><li>Identify method for routing conduit across roadways and structures.</li></ul>	<ul style="list-style-type: none"><li>Complete details for mounting signal equipment on structures.</li><li>Wire notes, wire schedule and construction notes completed.</li><li>Breaker schedule completed.</li><li>Include power for signing, illumination and ITS in plans.</li><li>Conduit fill and junction box capacity calculations</li><li>Signal display notes completed.</li></ul>		
Pole Schedules and Structural Design		<ul style="list-style-type: none"><li>Coordinate with State Bridge Office for attachment to structures.</li><li>Signal pole locations identified.</li><li>Request soil data and prepare cross-sections for each pole location.</li><li>Calculate A1 and A2 heights for proposed and future phasing to verify clearances.</li></ul>	<ul style="list-style-type: none"><li>Signal pole foundation designs completed.</li><li>Complete details for mounting poles on structures</li></ul>		
Specifications			<ul style="list-style-type: none"><li>Obtain approval for use of proprietary items, if applicable.</li><li>Complete Regional and General Special Provision run list (include salvaged materials, use of State furnished materials &amp; other commitments by the State.)</li><li>Complete project specific specials.</li><li>Include state standard details to be used.</li><li>Complete provisions for maintaining existing electrical systems</li></ul>	<ul style="list-style-type: none"><li>Obtain approval of special provisions.</li></ul>	
Estimate			<ul style="list-style-type: none"><li>Provide itemized construction cost estimate for each lump sum bid item.</li></ul>		